RU-C2 Pre-Design Investigation PARCEL C

Hunters Point Naval Shipyard
July 2012

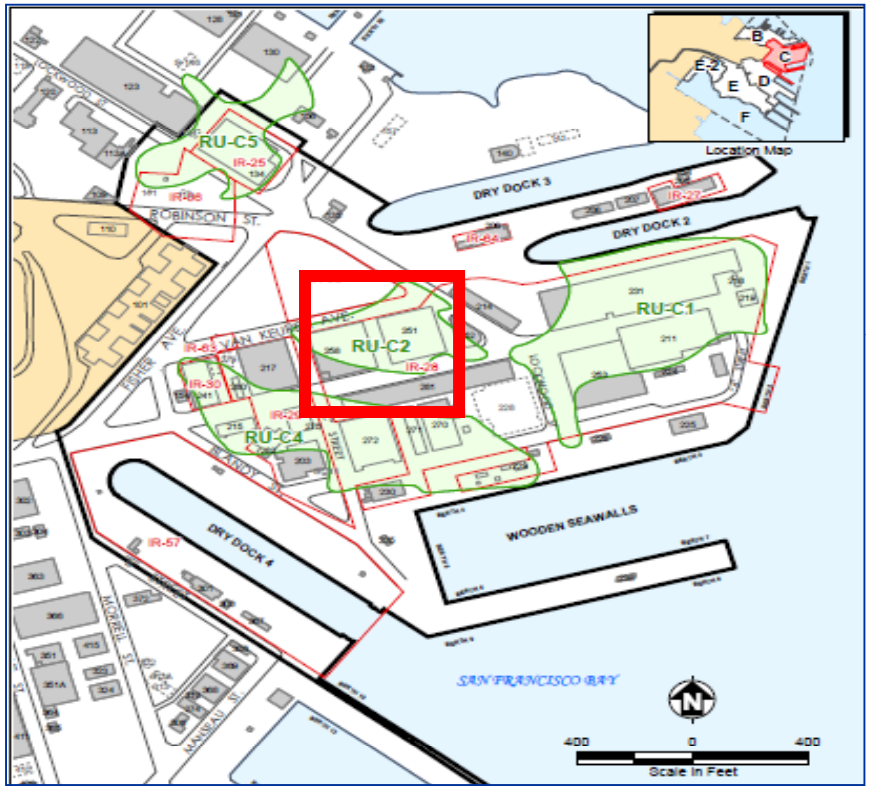
Contract No. N62473-06-D-2206
Delivery Order No. 0093

Overview

- Background
- Purpose of pre-design
- Pre-design work
- Results
  - Building 251
  - Building 258
- Summary
- Schedule

RU-C2 Background

- Located in center of Parcel C, west of RU-C1 and north of RU-C4
- Key Features- Buildings 258 and 251
- Two VOC plumes in groundwater
- Primary Groundwater COCs- TCE, PCE, carbon tetrachloride, and chlorobenzene
- Primary soil COCs- arsenic, lead, zinc, PAHs

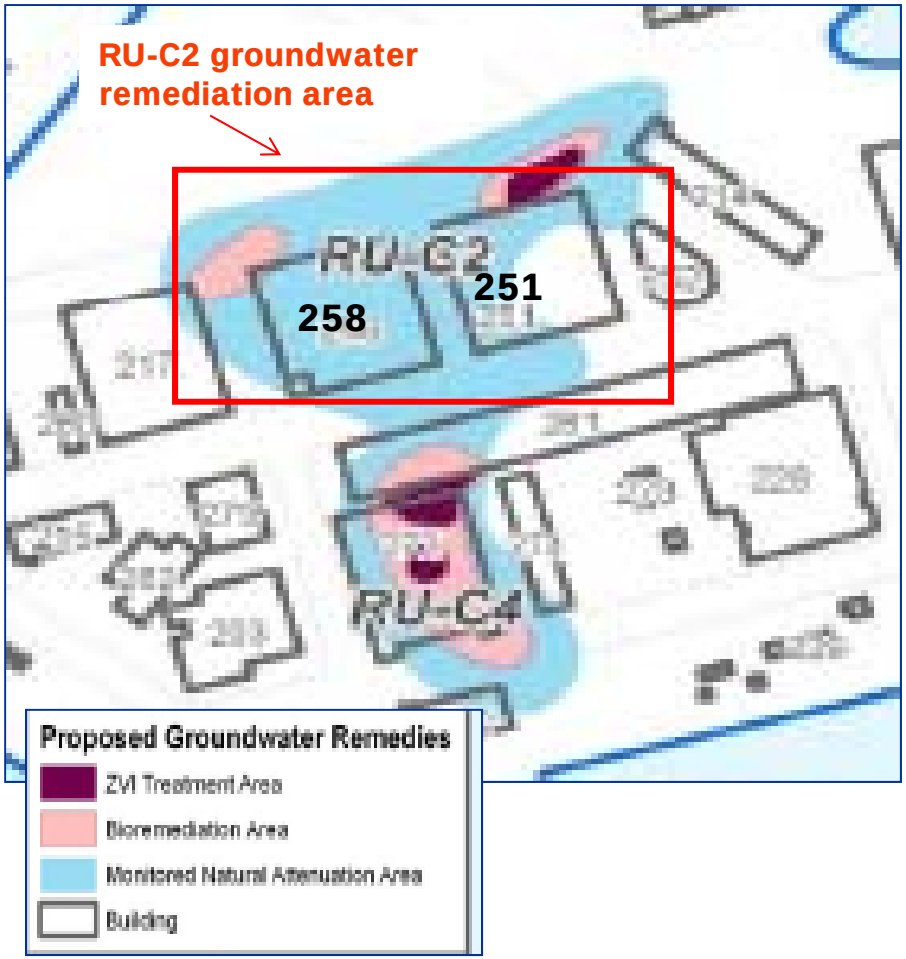


RU-C2 Location Map

ROD Summary- Groundwater

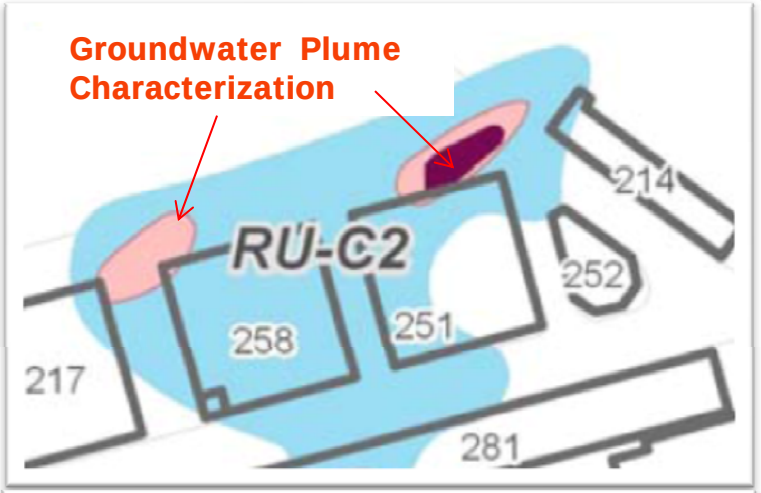
- Remedial Action Per the Final Parcel C ROD

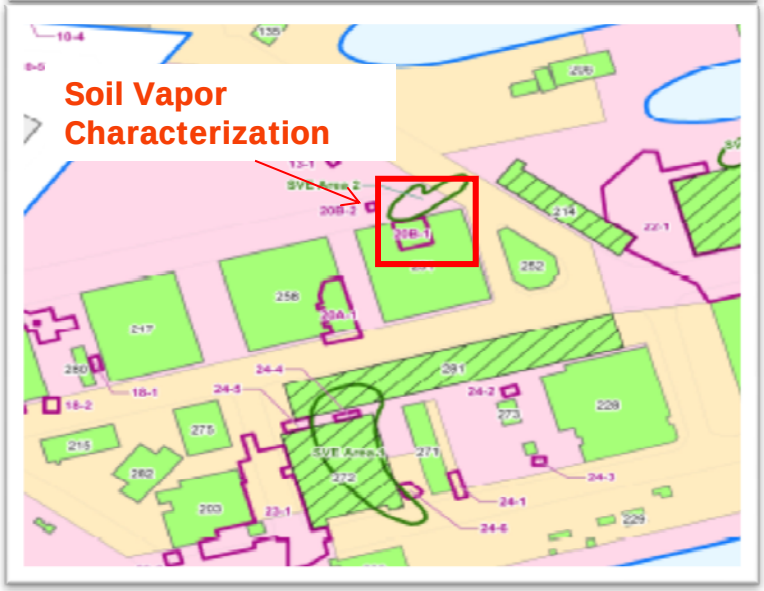
- In-situ remediation of VOCs in groundwater
  - ZVI Remediation Area
    - PCE > 15 ug/L
    - TCE > 110 ug/L
  - Bioremediation Area
    - VOCs exceed respective RGs by 10-50 times after ZVI injections
  - MNA Area



Purpose of Pre-Design Characterization

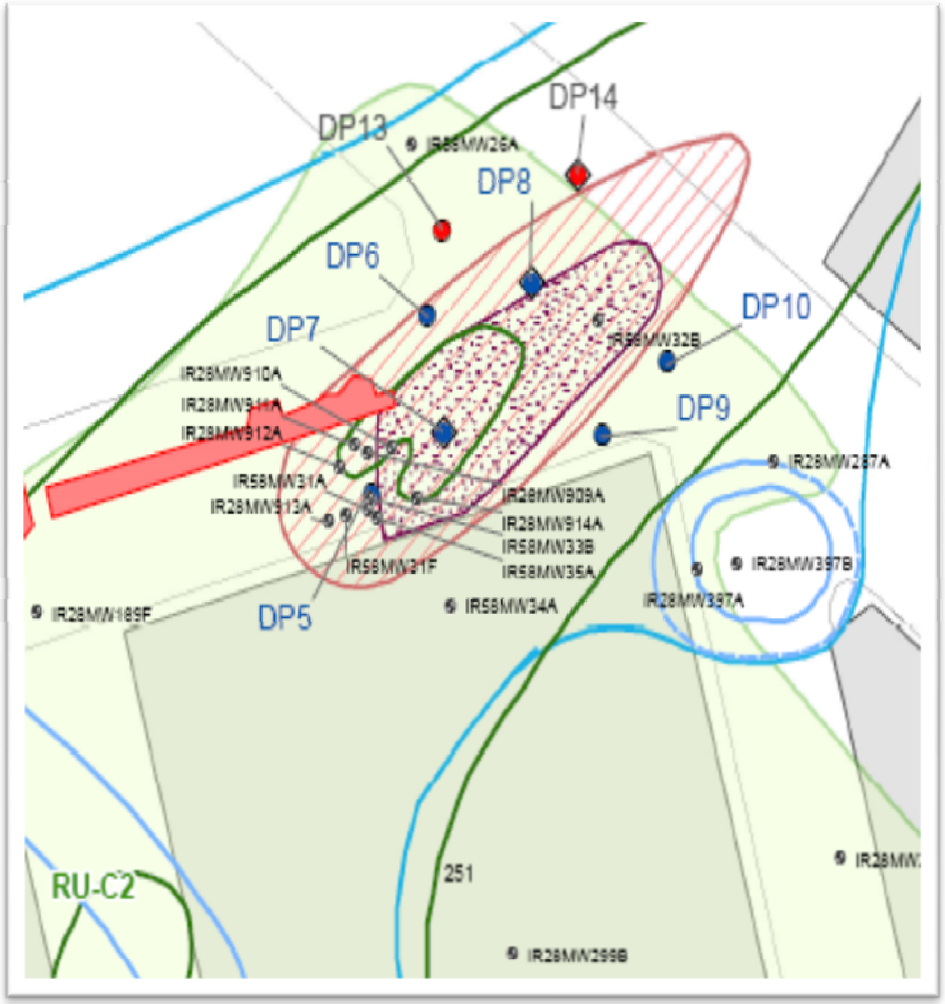
- Groundwater and soil investigation- VOC plume characterization in support of in-situ remediation
- Soil vapor investigation- Define area warranting soil vapor extraction (SVE) at Building 251





Building 251 Summary

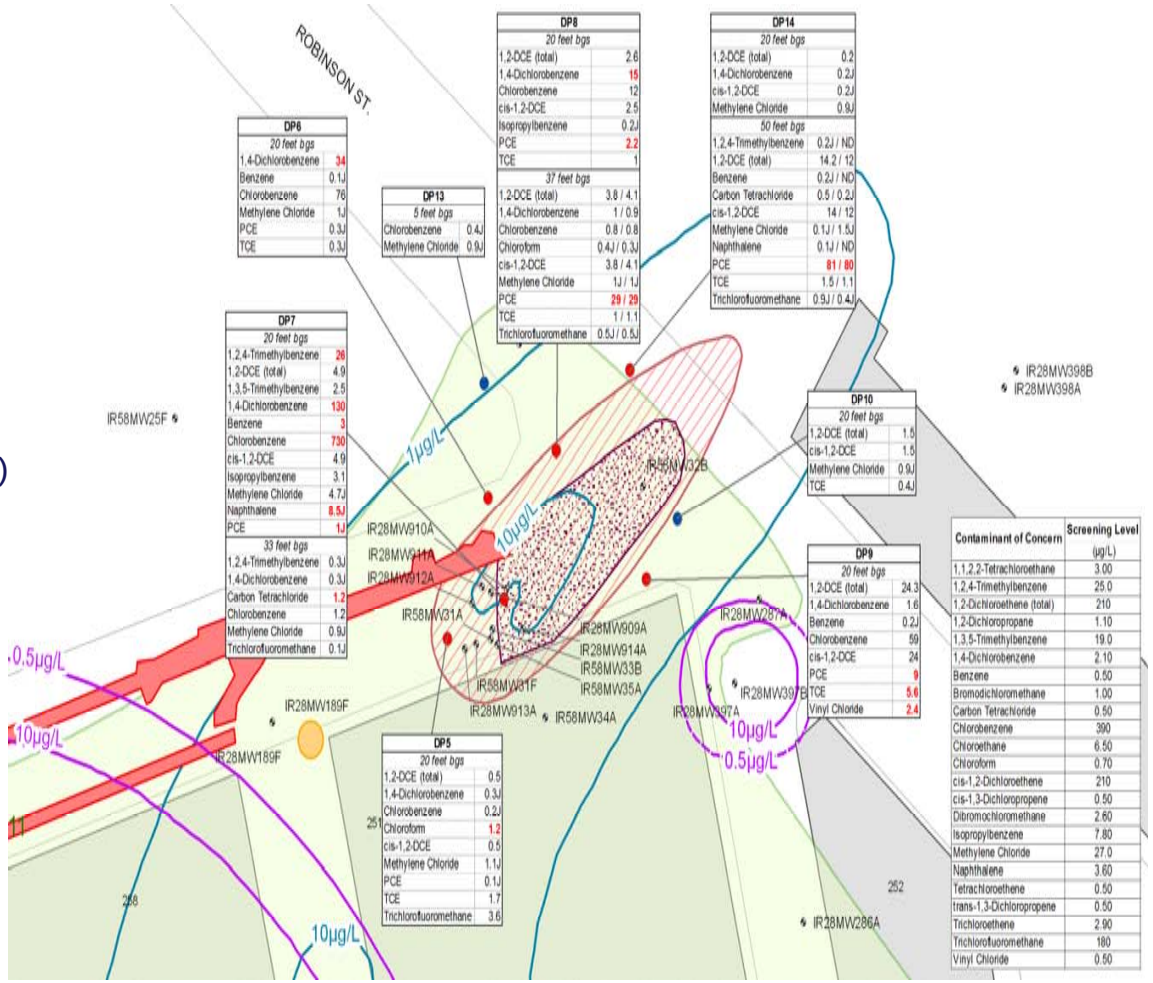
- Completed 6 Tier I hydropunches targeting Building 251 plume
- Completed 2 Tier II step-out hydropuches through TRIAD discussions
- Soil and grab groundwater sampling at 20 ft bgs. Samples were collected deeper (33 – 50 ft bgs) at a subset of 3 locations
- Analysis for VOCs
- Bio-indicator analysis at 5 locations (dissolved gasses, alkalinity, anions, sulfide, and DHC)
- Collected soil vapor samples at 9 locations.



Building 251 Groundwater Results

- COCs exceeded residential screening levels in groundwater at 5/8 shallow locations (20 ft bgs) and at 3/3 deeper locations (33 – 50 ft bgs).
- COCs detected in the shallow zone include 1,4-DCB, 1,2,4-Trimehtylbenzene, chlorobenzene, naphthalene, chloroform, PCE, TCE, and vinyl chloride.
- COCs detected in the deeper zone (33-50 ft bgs) include carbon tetrachloride and PCE.

Building 251 VOC Remediation Area



Building 251 Soil Results

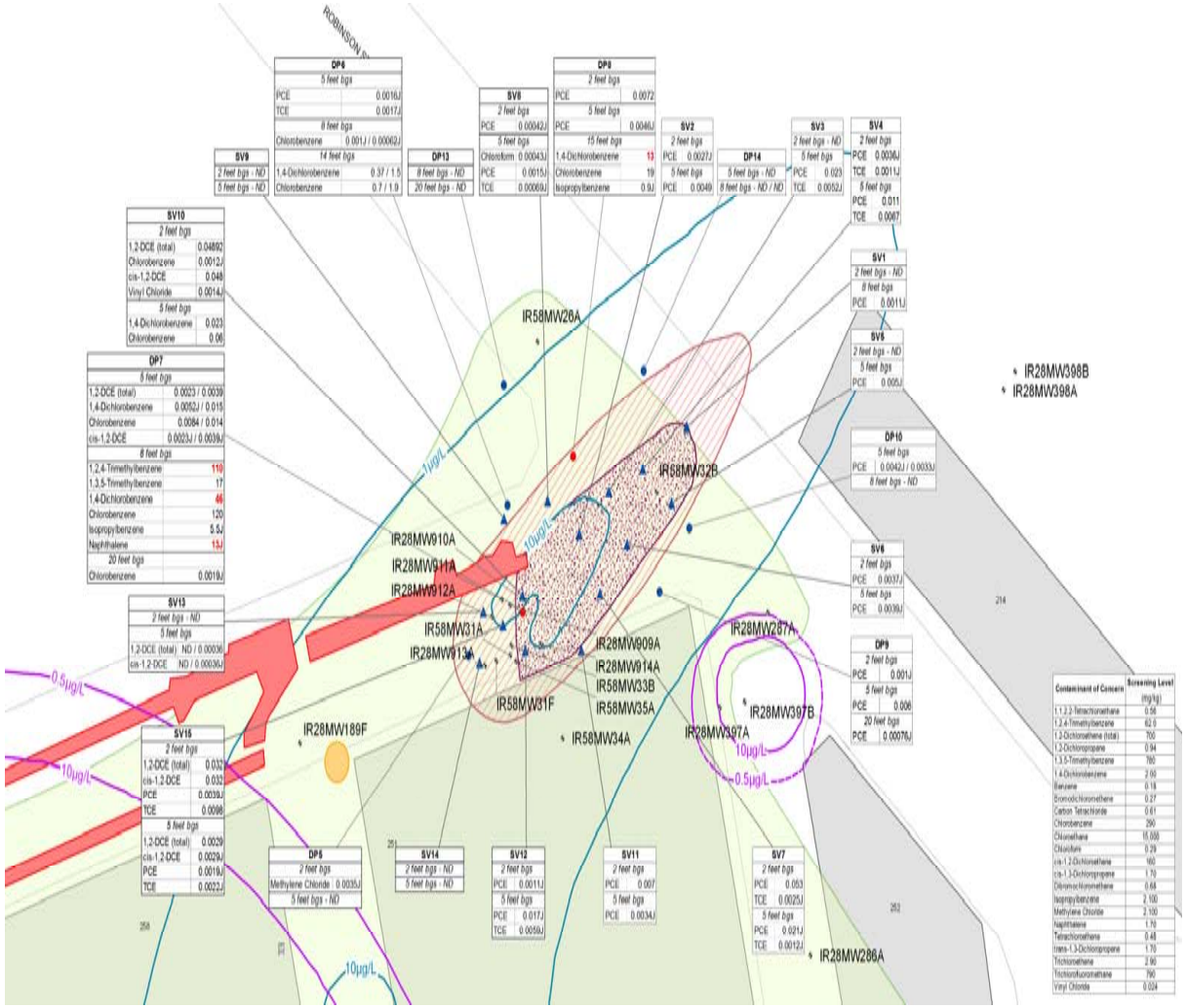
- Soil samples were collected from soil vapor sampling locations and hydropunch locations.

  20 samples were collected from 8 hydropunch locations (2 – 20 ft bgs)

  30 soil samples were collected from 15 soil vapor sampling locations (2 - 5 ft bgs)

- COCs exceeded residential screening levels at 2 locations (DP-7 [8 ft bgs] and DP-8 [15 ft bgs])

- COCs exceeding residential screening values include 1,2,4-trimethylbezene, 1-4 dichlorobenzene, and napthalene



Building 251 Soil Vapor Results

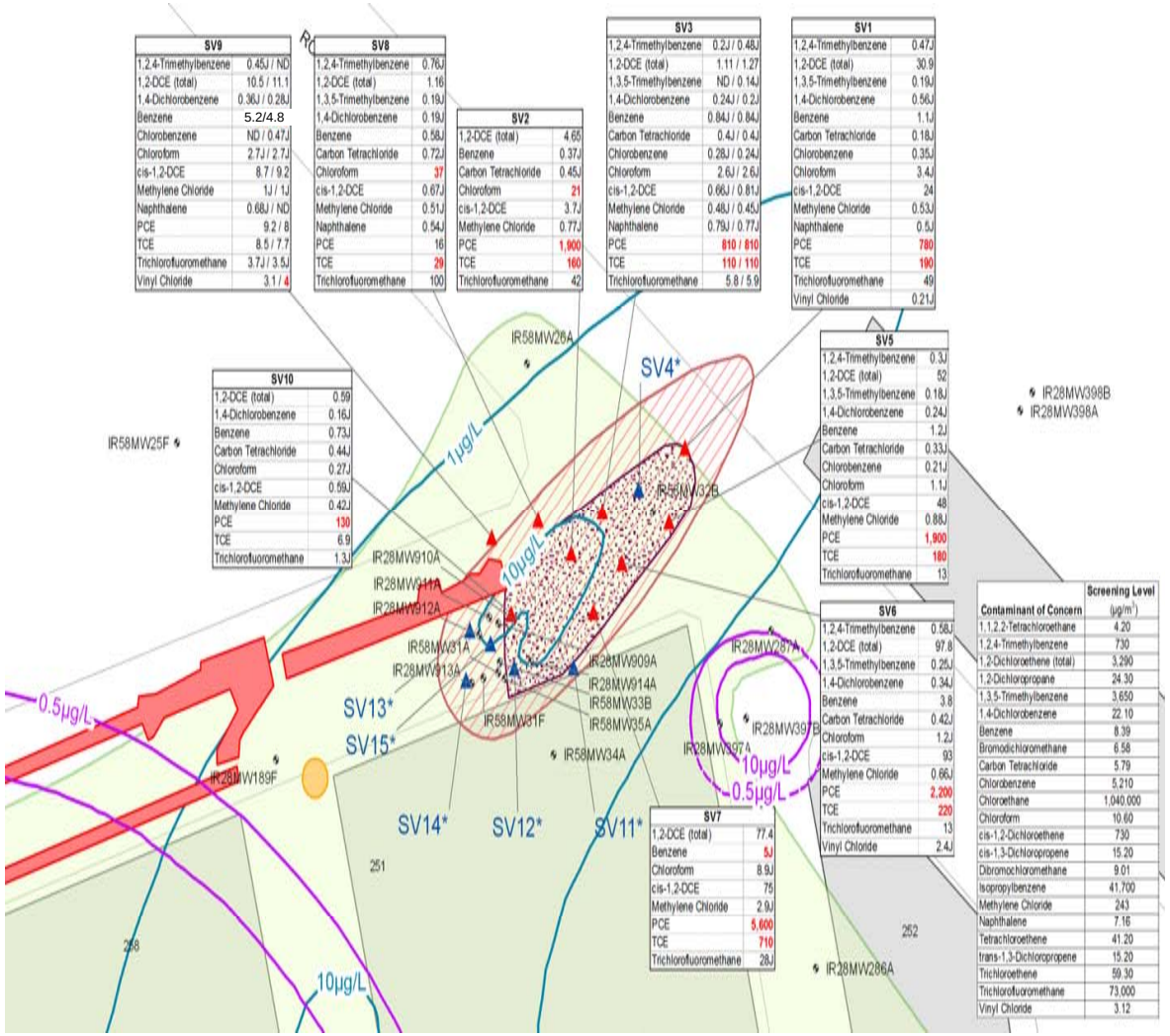
- COCs exceeding SGALs (9 samples total)

-Chloroform (2/9):
  - Max 37 µg/m³ exceeding the SGAL of 10.6 µg/m³

- PCE (7/9):
  - Max 5,600 µg/m³ exceeding the SGAL of 41.2 µg/m³

- TCE (7/9):
  - Max 710 µg/m³ exceeding the SGAL of 59.3 µg/m³

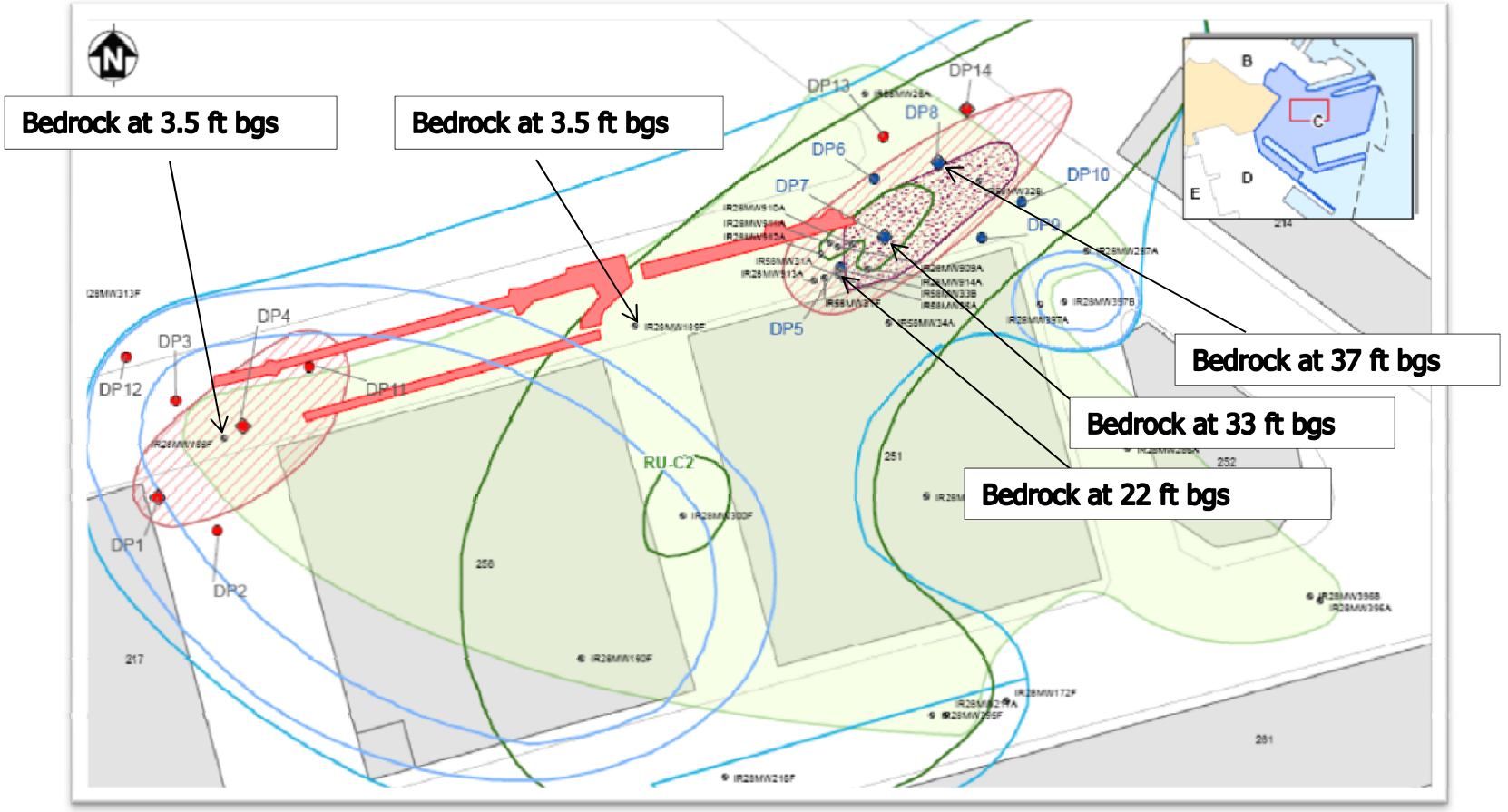
- Vinyl Chloride (1/9):
  - Max 4 µg/m³ exceeding the SGAL of 3.12 µg/m³



Building 258 Summary

- Hydropunch borings to collect soil and groundwater were attempted in February 2012 with a DPT drill rig and bedrock was encountered at 3.5 ft bgs.
- Soil vapor samples were collected in April 2012 at 9 locations through BCT concurrence.
- Eight temporary monitoring wells (shallow and deep) were installed at six locations in the Building 258 area. Each shallow well was completed at 20' bgs. Two deeper wells were competed at 40' bgs (TP3-40) and 50' bgs (TP6-50). Temporary well TP3-40 was completed at 40' bgs due to a high capacity water bearing zone that was encountered.
- Temporary wells were installed from June 11th to June 13th using a air rotary drill rig with a air hammer drilling bit.
- Groundwater samples were collected for VOC analysis on June 18th and June 19th following a 72-hour waiting period for the wells to equilibrate.
- Dissolved oxygen (DO) and temperature readings were collected from the temporary wells prior to sampling and were consistent with historic data in the area.
  - DO ranged from 1.55 mg/L to 3.83 mg/L compared to 2.5 mg/L in well IR28MW188F on 9/20/2010.
  - Temperature ranged from 17.3 °C to 20.0 °C compared to 18.45 °C in well IR28MW188F on 9/20/2010.

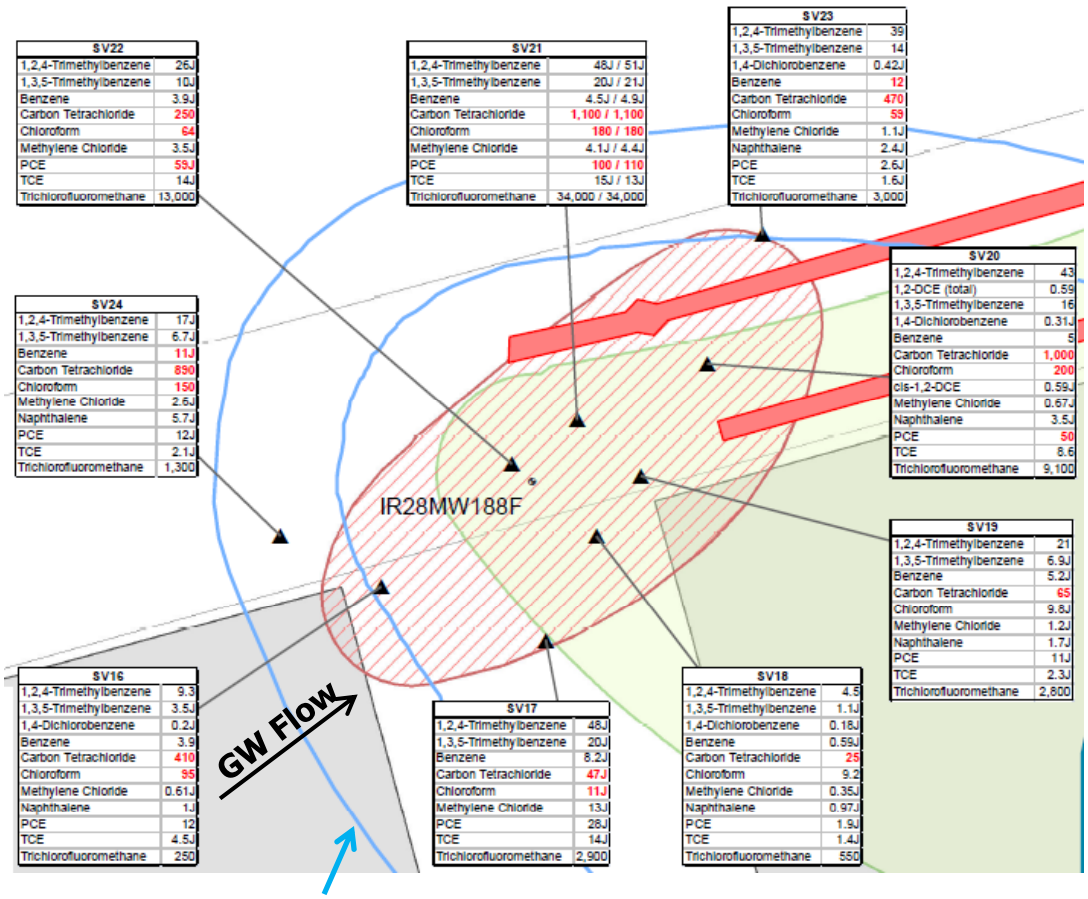
Occurrence of Bedrock



Building 258 Soil Vapor Results

- Carbon Tetrachloride is the primary COC in this area.
- COC Exceeding SGALs
  (9 samples total)
  - Carbon Tetrachloride (9/9):
    - Max. 1,100 µg/m^3 exceeding the SGAL of 5.79 µg/m^3
  - Benzene (2/9):
    - Max. 12 µg/m^3 exceeding the SGAL of 8.39 µg/m^3
  - Chloroform (7/9):
    - Max. 200 µg/m^3 exceeding the SGAL of 10.6 µg/m^3
  - PCE (3/9):
    - Max. 110 µg/m^3 exceeding the SGAL of 41.2 µg/m^3

Building 258 VOC Remediation Area

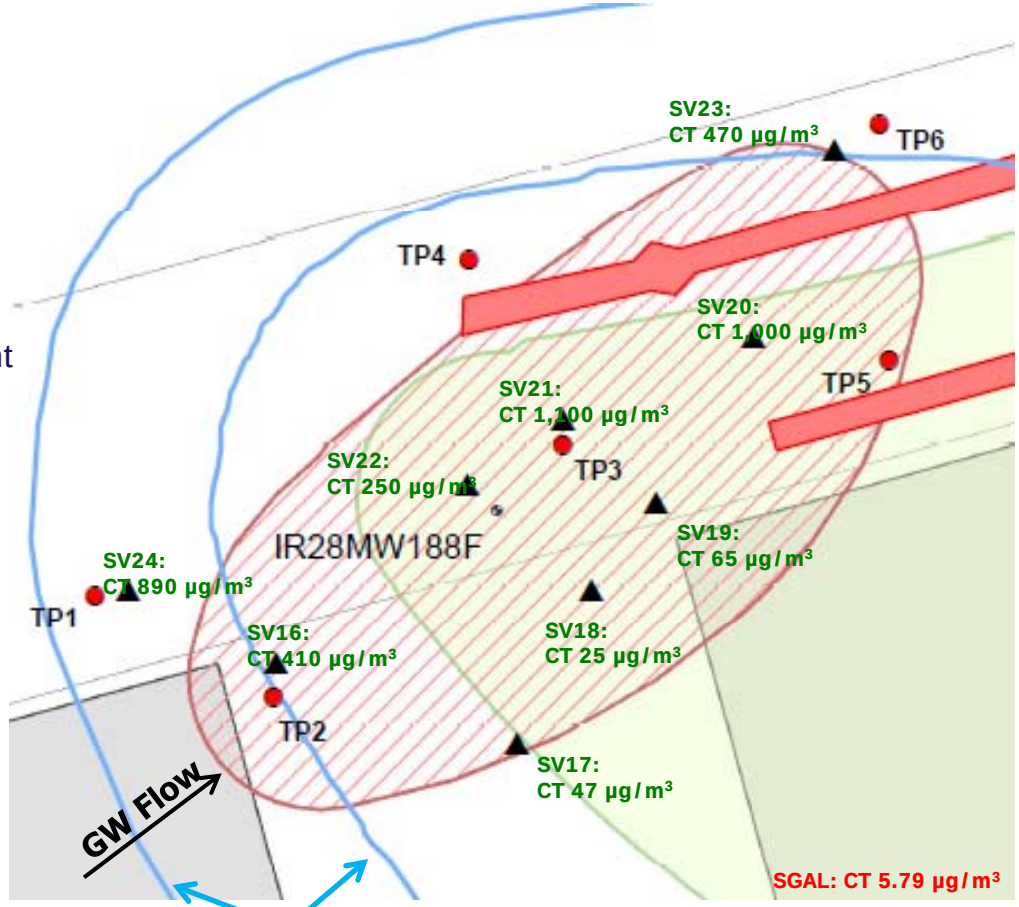


Building 258 Temporary Well Placement Rationale

Building 258

- Assess potential secondary source from building 217 (TP1 and TP2)
- Delineate bioremediation area (TP4, TP5, and TP6)
- Target location of highest carbon tetrachloride in soil vapor (TP3)
- Vertical delineation to 50’ for high hits and downgradient locations (TP3)
- Proposed air rotary rig to penetrate bedrock and drill to 20 feet bgs at 6 locations (TP1–TP6)

Building 258 VOC Remediation Area



Pre-Design Investigation Activities-2012

Installation of temporary well TP-2

Pre-Design Investigation Activities-2012

Installation of temporary well TP-3

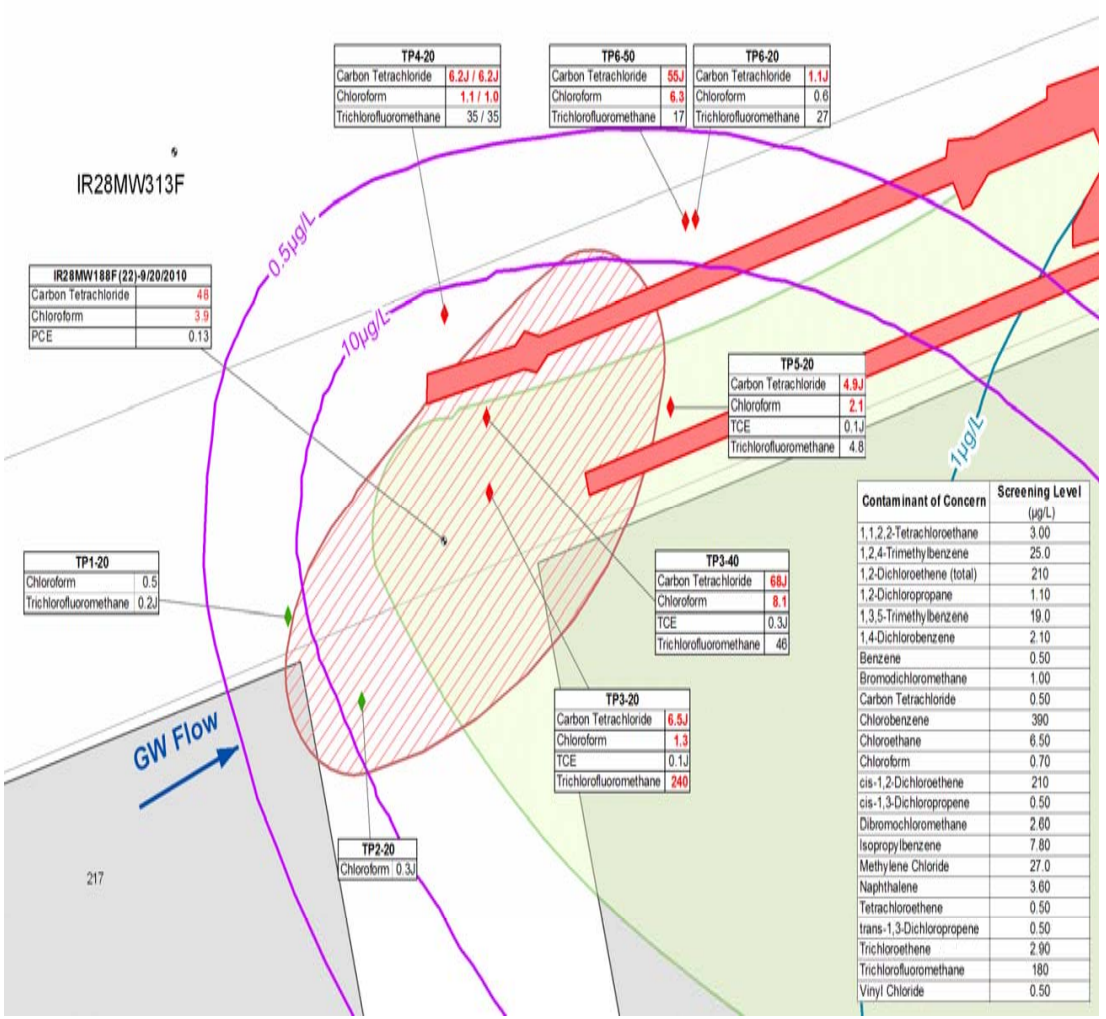
Building 258 Groundwater

COC exceeding Residential Screening Levels (8 samples total from 6 locations)

Groundwater samples were collected at 6 locations (20 ft bgs), deeper samples (40 and 50 ft bgs) were collected at a subset of two of those 6 locations.

- 6/8 samples exceeded residential screening values.
- COCs exceeding their representative screening values include carbon tetrachloride, chloroform, and trichlorofluoromethane (freon-11).

Lack of COC exceedances upgradient suggest that Building 217 is not likely a contributing source to groundwater contamination



Summary

- ZVI, bioremediation, and SVE were delineated at Building 251.
- Primary COCs at Building 251 are PCE, TCE, and chlorobenzenes.
- PCE and TCE were detected in groundwater at higher concentrations in the deeper sampling interval (37 and 50 ft bgs).
- Bioremediation area was delineated at Building 258.
- Carbon Tetrachloride is the primary COC at Building 258.
- Building 217 does not appear to be a source.
- Temporary monitoring wells will be left in place until the remedial action phase to obtain additional groundwater samples. The wells will be abandoned prior to injections so they do not provide preferential pathways.
- Data to be included in Remedial Design to be issued 7/27.

Pre-Design Investigation Activities-2012

- Schedule
  - Building 251 soil, groundwater, and soil vapor investigation — Feb. 13-17, 2012
  - Building 258 soil vapor investigation — Apr. 16-17, 2012
  - Building 258 groundwater investigation (tentative) — Jun. 11-15, 2012
  - Sample analysis and data validation — Jun. 18-Jul. 3, 2012
  - Technical Memorandum (Appendix to Draft Final Parcel RD) — Jul. 27, 2012
  - Draft RU-C2 RAWP — Aug. 27, 2012
  - Final Parcel C RD (other contractors) — Sept. 18, 2012
  - Final RU-C2 RAWP — Nov. 28, 2012
  - Implement Remedial Action — Dec. 2012